



# Standards: What They Are and Why They Are Important

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# What are Standards?

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Standards specify how to do things consistently, to:

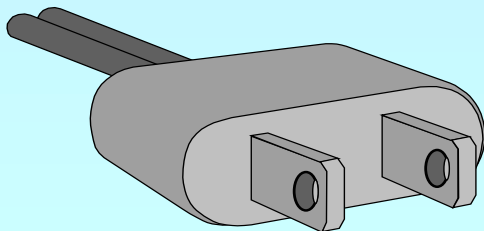
- ▶ Speed acceptance and deployment of products and services
- ▶ Enable compatibility, interchangeability, and/or interoperability
- ▶ Contain costs
- ▶ Minimize confusion
- ▶ Assure quality



# Advantages of Using Standards



- ◆ Uniform *light bulbs* and sockets
- ◆ No need for different types of *diskettes* for every computer
- ◆ The same *plug* for electrical devices and the same socket for outlets
- ◆ Consistent design, layout and color of *traffic signs* in each state



Standards - 3





# How Can Standards Benefit Users?

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- ◆ Reduced risk of single point of supply
- ◆ Promote forward/backward compatibility
- ◆ Reduced risk of obsolescence
- ◆ Reasonable assurance of quality
- ◆ Lower risk of being locked in to proprietary products
- ◆ Provide ability to buy components from different manufacturers
- ◆ Lower prices through increased competition in the marketplace
- ◆ Lead to compatibility and interoperability
- ◆ Help speed entry of smaller competing producers



# How Can Standards Benefit Producers?

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- ◆ Help build confidence in marketplace stability
- ◆ Encourage investment and involvement
- ◆ Promote industry growth
- ◆ Lower market entry risk
- ◆ Lower product liability risk
- ◆ Help convince customers that products are stable



# Compatibility/Interoperability

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- ◆ Adjoining products/systems can work together cooperatively
- ◆ Ability to interconnect devices from different manufacturers interchangeably
- ◆ Same product will operate correctly and consistently wherever it is....
  - ▶ Can use same radio throughout the country
  - ▶ Cell phone works anywhere you go
  - ▶ Trains can run on tracks nationwide



# Kinds of Standards

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- ◆ Performance standards
- ◆ Design standards
- ◆ Interface standards
- ◆ Enabling standards



# Performance Standards

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- ◆ Results oriented - specify what products should do:
  - ▶ Braking distance
  - ▶ Miles per gallon
  - ▶ Emissions caps
  - ▶ Pavement characteristics
- ◆ Maximum room for innovative design





# Design Standards

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- ◆ User-consistency oriented
- ◆ Specific product structure or appearance
  - ▶ Uniform traffic controls and devices
  - ▶ P R N D 2 1
  - ▶ 1024 x 768 pixels
  - ▶ Zip Codes



# Interface Standards

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- ◆ Connection-oriented, toward specific interconnection of components or systems
  - ▶ Physical compatibility (e.g., plug compatibility)
  - ▶ Communications protocols
  - ▶ Information content
- ◆ Help keep design issues separate - facilitate interoperability



# Enabling Standards

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- ◆ Broadly based references or methods oriented
- ◆ Foundation for multiple products and services
  - ▶ Location referencing
  - ▶ Data dictionaries
  - ▶ Message templates



# Methods for Creating Standards

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## 1. De facto

- ▶ IBM personal computer

## 2. Regulatory

- ▶ Corporate Average Fuel Economy (CAFE)

## 3. Consensus

- ▶ ITS Databus



# 1. De Facto Standards

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- ◆ Most common where there is a dominant participant (e.g., IBM personal computers)
  - ▶ Predominance of one entrant (e.g., Microsoft Windows)
  - ▶ Agreement of market leaders (e.g., CDs)
  - ▶ Prolonged market struggle (e.g., VHS vs. Beta)
- ◆ But can also arise from other market forces



# Open vs. Proprietary Standards

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- ♦ “Open” - Other producers allowed into market (e.g., IBM PC “Wintel” standard)
- ♦ “Proprietary” - Exclusive to developer or licensee (e.g., Apple Macintosh)

*Open standards encourage industry growth  
plus secondary markets*



## 2. Regulatory Standards

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- ◆ Created or adopted and enforced by public agencies
- ◆ Usually associated with infrastructure
  - ▶ Public safety and health (e.g., air quality, product labels, highway signage)
  - ▶ Fair allocation of scarce resources (e.g., frequency spectrum allocation)
  - ▶ Situations where economics requires a single solution (e.g., telephone and electric service)



### 3. Consensus Standards

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- ◆ Open by nature
- ◆ Voluntary agreements
  - ▶ Vendors and users
  - ▶ Government agencies
  - ▶ Advocacy groups, industry consultants, etc.
- ◆ Standards development organization (SDO) process
  - ▶ Professional or industry associations
  - ▶ Accredited by American National Standards Organization (ANSI)





# Consensus Standards Process

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- ◆ Open to all interested parties
- ◆ Characterized by due process
- ◆ Agreement through cooperation and compromise
- ◆ Consistent with internationally accepted procedures



# Consensus Standards Life Cycle

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- ◆ Identification of need
- ◆ Analysis of requirements
- ◆ Development of specifications
- ◆ Approval of draft document
- ◆ Testing of specifications (validation, verification)
- ◆ Acceptance and use
- ◆ Maintenance (update, retire)



# Why Consensus Standards are Difficult to Develop

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- ◆ Work is mainly political
  - ▶ Harmonizing conflicting vested interests
  - ▶ Trust-building needed
  - ▶ Pain must be equalized

- ◆ Work is mainly volunteer effort

*So why do it this way?*

**Result is durable, well-accepted standards!**